

Pupation was not observed in the wild, but in captivity final instar larvae moved off the plant and pupated either loosely in the debris in the rearing container or attached to debris by the cremaster only.

The duration of the immature stages was as follows: egg – 3 days; first instar larva – 4 days; second instar larva – 3 days; third instar larva – 3 days; fourth instar larva – 5 days; fifth (final) instar larva – 7 days; pupa – 7 days.

Other food plants that have been observed previously are: Matchbox bean, *Entada phaseoloides* (L.) Merr (Mimosaceae) at Cooktown (P. Samson, pers. comm.) and two unidentified plants on Thursday Island and at Iron Range (S. Johnson, pers. comm.).

Further racemes of *Allophylus cobbe* collected to feed the original larvae were examined under a microscope and, as a result, many eggs and larvae of *Megisba strongyle nigra* (Miskin) were also located and isolated. The life history of that species was documented by Lambkin and Samson (1989).

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BIOLOGICAL OBSERVATIONS ON THE AUSTRALIAN ENDEMIC APHID *APHIS ACAENOVINAE* EASTOP (HEMIPTERA: APHIDIDAE), INCLUDING A NEW HOST PLANT RECORD

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Abstract

Aphis acaenovinae Eastop is one of two Australian endemic *Aphis* Linnaeus species descended from a Gondwanan group possibly ancestral to the highly speciose northern hemisphere Aphidini. Data on its biology are summarised and some new observations are presented, including natural enemies and a new host plant, the introduced *Geum urbanum* L. (Rosaceae).

Introduction

The endemic *Aphis acaenovinae* Eastop and *A. platylobii* Carver & White are morphologically unusual members of the genus *Aphis* Linnaeus. It has been suggested (von Dohlen and Teulon 2003) that the Australasian members of *Aphis* and related genera belong to a Gondwanan group apparently ancestral to the highly speciose northern hemisphere Aphidini. Hence, any biological information on these species is of broader interest and may contribute to their conservation.

Aphis acaenovinae is widespread, with records from all eastern States. It is, however, generally found at higher altitudes where the habitat is threatened in the short term by bushfires and in the longer term by global warming. Reported here are some observations on the biology of *A. acaenovinae*, including records of host plants. Previously published data on its biology are also summarised.

History of *Aphis acaenovinae*

Aphis acaenovinae was discovered by Eastop in the spring of 1959 in Canberra, Australian Capital Territory, on a host plant noted as *Acaena ovina* (Rosaceae) and was described soon afterwards (Eastop 1961 [dated 1960 but actually published in March 1961: V. Eastop, pers. comm.]). Additional specimens were collected from Moericke yellow traps in the Canberra region in xi.1959, x.1960, xi.1960, iv.1961, iv.1962, x.1962, xi.1962 and iii.1966. The present author collected specimens from Budthingeroo Creek near Jenolan, New South Wales, in xii.1974 and from the Brindabella Ranges in i.1975. The host plant for the latter collections was determined as *Acaena anserovina* (Orchard 1969 [originally considered a hybrid, now regarded as a species: <http://plantnet.rbgsyd.nsw.gov.au>]) and all subsequent collections from *Acaena* have been from this species. The Budthingeroo Creek specimens yielded the introduced parasitoid *Lysiphlebus testaceipes* (Cresson) (Hymenoptera: Aphidiidae) (Starý and Carver 1979, Carver and Franzmann 2001), indicating how biological control agents can affect non-target species. *Aphis acaenovinae* is also known from Queensland, Victoria and Tasmania (M. Carver, pers. comm.).

Aphis acaenovinae was not found in the Snowy Mountains during a search at many localities in February 2004, following the January 2003 bushfires of Canberra and the Southern Alps, but was collected in the Brindabella Ranges on 19.iii.2005. It was readily found in the same Snowy Mountains localities as previously searched on 14.xii.2006.

Mier Durante and Ortego (1998) described a new species, *Aphis acaenaevora* Mier Durante & Ortego, from *Acaena splendens* Hook. et Arn. in Argentina, but found it to be distinctly different from *Aphis acaenovinae*, in particular lacking the long, slender siphunculi shared by *A. acaenovinae* and *A. platylobii*. Further investigation of *Acaena* and other southern Rosaceae may yield more new species of southern aphids.

Biological observations

While collecting in the Brindabella Ranges in 2005, I observed that attendant ants built up a loose cover of vegetation fragments over the stems and leaves bearing the aphids. Unidentified scale insects (Coccoidea) were also present. The microenvironment around the colonies was noticeably warmer than the general surroundings, possibly facilitating more rapid insect development. Extensive work on wood ant mounds in Europe has shown that the metabolism of the insects, as well as physical features of the mounds, contributes to raised mound temperatures and that microbial action on organic matter also contributes in some circumstances (T. Domisch, pers. comm.).

During the 2006 fieldwork, *A. acaenovinae* was discovered for the first time on a host plant other than *Acaena* spp., being present in very large, free-living colonies on *Geum urbanum* L. (Rosaceae), an introduced species, near Thredbo, New South Wales. A voucher sample of the plant is held at the Downing Herbarium, Macquarie University [accession number 73008058]. Numerous syrphid (Diptera: Syrphidae) eggs were observed among the aphids on the *Geum* and larvae of *Leucopis* sp. (Diptera: Chamaemyiidae) were feeding on aphids found on *Acaena* at Charlotte's Pass, New South Wales. Small numbers of ants were present. Further collections were made from *Geum* at Thredbo on 6.iii.2008 and 17.iv.2008. The April collection contained only sexual forms.

Some apterae on *Geum* were larger than those on *Acaena* (type series and collection from 19.iii.2005: Table 1) and occasionally had one or two rhinaria on antennal segment 3, in contrast with the type series. Blackman and Eastop (2006) listed aphids recorded from *Geum* spp. but none fall in the tribe Aphidini. Use of Blackman and Eastop's (2006) key to aphids on *Geum* will place *A. acaenovinae* among the polyphagous aphids, and the key to polyphagous aphids will lead to an unresolved placement in *Aphis* or *Toxoptera* Koch.